MONITORING OF TRITIUM CONTENT IN THE WATER OF THE RIVERS YENISEI AND ITS TRIBUTARY

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In the Krasnoyarsk region there is a Mining and Chemical Combine (MCC) of the Ministry of Nuclear Industry of the Russian Federation which has been operating for more than fifty years producing weapon-grade plutonium. Since 2001 the monitoring of tritium content in the Yenisei River water has been carried out to estimate the role of MCC in the radiation influence on the ecosystem of one of the most full-flowing rivers in Russia.

It was established that the river waters close to the industrial zones of MCC contain tritium in the concentrations of 50-200 Bq/l, which are 10-40 times higher than the background values for the River Yenisei. (~5 Bq/l). Downstream from MCC (15km) the tritium content decreases down to 12-17 Bq/l, which is likely to be caused by its dilution in the Yenisei River water flow.

The tritium content in the water of the river Bolshaya Tel, the right tributary of the river Yenisei, amounts to 10-15 Bq/l (2-3 times higher than the background value) and near the mouth of the river Bolshaya Tel ~50 Bq/l (~ 10 times higher), which is 10 km upstream. To specify the nature of the tritium discharged into the river Bolshaya Tel, the tritium content in the river sediment layers was determined. It was found that besides tritium (~59 Bq/l), whose content was higher than that in the water layer close to the river sediment (~15 Bq/l), ^{14}C (~14 Bq/l) was present. On this basis an assumption was made about the hydrological connection between the underground facilities for nuclear waste storage of the landfill "Severny" and the surface waters.

To confirm the existence of such a connection simulation experiments aimed at studying tritium migration abilities in geological media (various mineral composition and genesis) were carried out. Determining tritium content in the samples taken at the column outlet showed the tritium migration rate to depend only on the soil density and the concentration of organic substances present in the samples.